



Creative Construction Conference 2017, CCC 2017, 19-22 June 2017, Primosten, Croatia

## The Interface between industrialized and project based construction

Niclas Andersson<sup>a</sup> Ph.D., Jerker Lessing<sup>b</sup> Ph.D. \*

<sup>a</sup>Faculty of Technology and Society, Malmö University, S 205 06 Malmö, Sweden

<sup>b</sup>Department of Building and Environmental Engineering, Lund University. S 221 00 Lund, Sweden

### Abstract

Today, digitalization is the single most significant change factor for the construction sector as well as for society in general, which will bring new opportunities for intelligent and sustainable cities, efficient management of available resources and a general reduction of carbon emissions. Digitalization will enable continuous and integrated information exchange between all actors of the construction process. The development of an integrated digital information infrastructure for the construction sector will reach beyond the traditional project process and e.g. include the urban planning processes, where geographical information systems (GIS) are currently used, and the manufacturing processes of industrialized construction where e.g. product data management (PDM) systems constitute the product information platform. This study provides a survey of the interface between industrialized and project based construction from an information and business relation perspective. The purpose and main objectives of the study are to review and map the current information exchange between industrialized and project based construction in order to identify existing and potential areas of digitalization and standardization for improved information flow. The survey finds that industrial suppliers still frequently use company specific product standards, that PDF-, Word- or Excel-files constitute the normally used file format and that recurrent restructuring and re-entering of information from one system to another characterize the information exchange. Further, contractors approach industrialized construction in three distinctive ways, and express a generally growing interest for industrialized construction, which include closer and more long-term business relations with industrial suppliers. Despite the identified problems of information exchange and lack of common standards, the survey concludes that improved business relations provides the most urgent area of development in order to better integrate the industrialized and project based construction.

© 2017 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the scientific committee of the Creative Construction Conference 2017

*Keywords:* Industrialized construction; building system; information infrastructure; building standards; classification systems; business relations

\* Niclas Andersson. Tel.: +46(0)703 949428  
[niclas.andersson@mah.se](mailto:niclas.andersson@mah.se)

## 1. Introduction

“Construction management is a problem of information - or rather lack of information” [1]. The building process is characterized by fragmentation, e.g. by its division into separated phases, a large number of highly specialized actors and a production process organized in temporary projects with new constellations of actors in every new project. The fragmented characteristics of construction provides a challenge for efficient coordination of processes, it impedes learning from experience, hinders continuous improvement by repetition and, requires significant coordination, communication and information exchange between all the various actors involved.

The increasing digitalization of the building process by implementation of building information modelling (BIM), virtual design and construction (VDC) etc. provides aspects of significant strategic importance for the development of new methods for information exchange and coordination between all actors in the building process [2]. BIM-based management of information helps to improve the quality of design information e.g. by clash detection of various MEP-models reducing the numbers of spatial conflicts of installations etc. [3]. With BIM and VDC, any building or construction can be visualized, simulated and analyzed already at an early phase of the construction process [4]. The fragmented and project based organization of construction provide lack of common incentives for long-term business relations and common strategies which altogether constitute examples of impediments for implementation and application of BIM [5].

Reference [2] emphasizes the need for common guidelines and consistent strategies for the development of common standards, file formats and forms of agreements, which all represent central conditions for BIM and VDC implementation. Smart Built Environment [6], a national Swedish strategic innovation program for the construction sector, brings forward digitalization in construction as the single most important development area for the construction sector today. Smart Built Environment underlines the importance of establishing coherent information exchange between the actors of construction in a broad sense [6]. Accordingly, digitalization should include the project-based construction process as well as urban planning and industrialized construction.

### 1.1. Problem statement

The development of an integrated digital information infrastructure for the construction sector will reach beyond the traditional project process and include the urban planning processes, where geographical information systems (GIS) are currently used, and the manufacturing processes of industrial construction supported by e.g. product data management (PDM) and product information management (PIM) systems. However, the significant difference between BIM- and GIS-models, where the BIM-model use a local separate coordinate system while GIS-models use geographical references, challenges and impedes efficient and integrative information exchange [7]. Further, the project based building process, the urban planning process and the manufacturing process of industrialized construction, represent fundamentally different production systems, which impedes the establishment of common information standards and coherent information exchange.

### 1.2. Purpose and objectives

This study constitutes a survey of the interface between industrialized and project based construction. The purpose and main objectives of the study are to review and map the current information exchange and business relations between industrialized and project based construction in order to identify both existing and potential areas of digitalization and standardization for improved flow of information.

The objectives of the study are expressed in the following research topics:

- Information deliveries – Objects and properties
- Information exchange
- Business relations

Information deliveries concerns the identification of any existing standards and classifications systems used to describe the properties of industrial components. Information exchange accounts for who shares information with whom, what information is exchanged and what file formats are used. Finally, business relations describes forms of cooperation, framework agreements, etc. between the industrial supplier and contractors.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات